



SYDENHAM

PHOSPHORUS REDUCTION INITIATIVE

INITIATIVE BY



February 2025 - Introducing SPRI!



Sydenham River

Introducing the Sydenham Phosphorus Reduction Initiative!

St. Clair Conservation recently secured four years of funding through the Canada Water Agency* to support the Sydenham Phosphorus Reduction Initiative (SPRI). The goals of SPRI are:

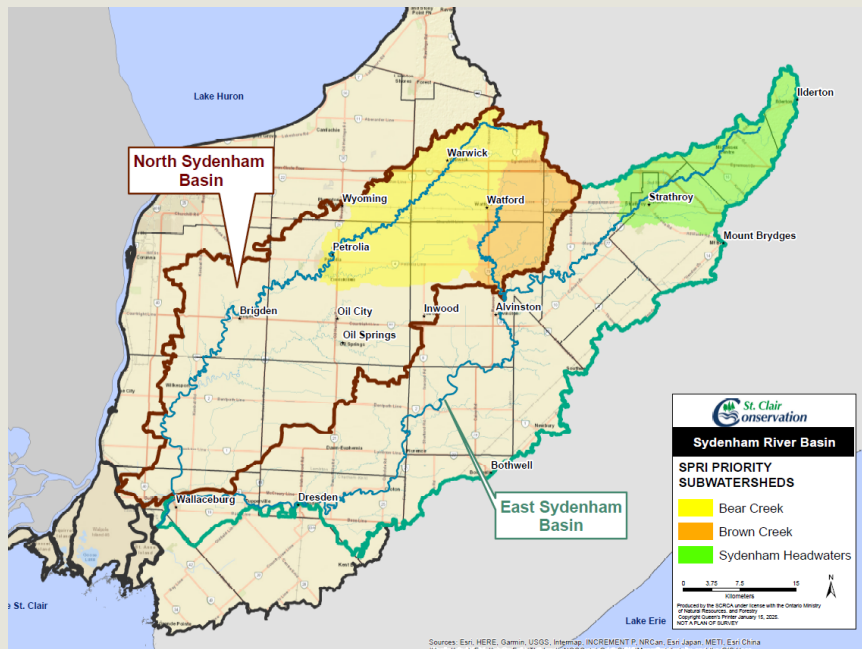
1. To decrease the overall non-point source phosphorus loads in the Sydenham River Watershed, as the River is the 3rd largest Canadian contributor of phosphorus to Lake Erie and,
2. To increase the adoption and sustainability of agricultural and rural Best Management Practices (BMPs) in high phosphorus yielding areas.

PRIORITY SUBWATERSHEDS

Much of the funding over the four years is directly aimed at supporting agricultural BMPs in the Sydenham River Watershed, with priority set in three sub-watersheds:

Bear Creek Headwaters, Brown Creek, and Sydenham Headwaters (see map).

You are receiving this newsletter because you reside in or own a property within these priority areas.



*The Canada Water Agency is a new, standalone branch of Environment and Climate Change Canada

ALGAL BLOOMS IN LAKE ST. CLAIR AND LAKE ERIE CAN BE SO LARGE THAT THEY ARE VISIBLE FROM SPACE.



NASA Earth Observatory - Lake St. Clair
Harmful Algal Blooms July 28, 2015



What are the concerns?

As producers, you understand phosphorus is a nutrient essential to life. It is found in all plants and animals as well as in their waste. Phosphorus comes in different forms including particulate and dissolved, which together make up total phosphorus (or TP).

Algae are a natural part of the environment but are limited by the amount of phosphorus present. As phosphorus becomes readily available, explosive growths of algae, known as algal blooms, can occur. Algal blooms can be toxic, pollute shorelines, and lower oxygen levels, all of which can impact the safety of water for drinking, recreation, and wildlife.

Nutrient enriched waters from the Sydenham Watershed contribute to the severe algal blooms and low oxygen zones that occur in Lake St. Clair and further downstream in Lake Erie. Algal blooms in the Lake Erie basin can be so large that they are visible from space. To address this issue, Canada and the U.S. are working together to reduce phosphorus loads to the lake by 40% from 2008 levels.

So, why a focus on the Sydenham River?

The Sydenham River Watershed drains 3,498km² of land in southwestern Ontario and is part of the Lake Erie basin. Actions in the watershed impact local water quality as well as conditions downstream.

Within the Sydenham watershed, agriculture is critical to the local economy and makes up 82% of the land use. The dominant crops are soybeans (38%), corn (23%), and wheat (10%), which together account for 71% of the overall agricultural land use in the watershed.

MOVEMENT OF PHOSPHORUS

The movement of phosphorus is closely tied to the movement of water on the landscape. The greatest movement of phosphorus occurs during the non-growing season (October to April) when many soils are exposed to rain and snowmelt, flushing dissolved and particulate (sediment-bound) phosphorus off the landscape into watercourses.

Using data from monthly and high-frequency sampling programs from 2012 to 2015, Environment Canada estimated that 86–91% of total phosphorus loadings to the Sydenham River occurred during runoff events.

Sources of Phosphorus in the Sydenham River Watershed

Phosphorus sources are divided into two categories: point and non-point sources. Point sources are known sources and are easy to identify. Non-point sources are not as easily identifiable or easy to address. Water quality monitoring and scientific models that compile and analyze multiple data sources (for example, crop rotations, soils, precipitation, climate, and many more) are important for estimating the loads from non-point sources.

Point Sources: There are 18 municipal sewage treatment plants and 14 industrial wastewater treatment plants in the watershed. Together, these facilities release **~26 metric tonnes** of total phosphorus every year into our watercourses through their treated effluent¹. Therefore, point sources account for approximately 11% of the annual total phosphorus load in the Sydenham River.

Non-Point Sources: Agriculture is the dominant land use in our watershed and the main non-point source of phosphorus. Runoff, whether overland or through subsurface tile drainage, contains fertilizers, pesticides, biosolids, compost, and soils and contributes **~201 metric tonnes** of total phosphorus, or 89% of the phosphorus load in the Sydenham River each year¹.

Agricultural land in the Sydenham Watershed is predominantly flat with poorly drained soils, leading to extensive use of buried tile drainage. In fact, 77% of the agricultural land in the watershed is tile drained. Subsurface drainage contributes significantly to the transport of dissolved phosphorus to watercourses.

Image shows large gullies created in field after rainfall.



SOLUTIONS

There is no single solution to reducing non-point sources of excess phosphorus from reaching the aquatic environment.

Adopting a range of practices that prioritize preventing, controlling, and finally capturing excess phosphorus (as well as the water that carries it) have a significant local impact. Future newsletters will highlight various practices that build soil health (prevent movement), control water within and below fields (control movement), and manage riparian areas (capture phosphorus before it enters a waterway).

A strong foundation of healthy soils is essential, followed by selecting practices tailored to the landscape and operation. Problem areas can also be addressed at both the watershed and field scale.



SCRCA hosts various events throughout the year. Above is an image from a Demo Day at one of SCRCA's McKeough Properties.

Planning Ahead – Nutrient Management Matters!

Periodically, the soil of farm fields can lack the necessary nutrients needed for crops to be successful throughout the growing season. If not addressed, the results may include poor plant growth and decreased yields. Fertilizers can be a necessary input for farmers needing to provide crops with nutrients that are not readily available in the soil. However, with added nutrients comes added responsibility. When fertilizer inputs go unmanaged, overapplication of nutrients can occur, resulting in economic losses and environmental degradation, particularly in watercourses.

You've heard it before, applying the Right source at the Right rate, Right time, and Right place is crucial in meeting budgets and avoiding environmental impacts. At the farm level, this means accessing 4R Nutrient Management services. Developing a long-term plan alongside a Certified Crop Advisor (CCA) will encourage proper utilization of commercial fertilizer, livestock manure, and crop residue; the rate inputs should be applied; the best time for application; and the proper placement of each amendment. Planning ahead and utilizing the 4Rs will allow for sustainable farm management and continued environmental stewardship. Find a CCA here: www.certifiedcropadviser.org/certifications/professional-search/.

If you are working with a local CCA to develop a Nutrient Management Plan for the next 5 years/crop rotations, let us know and we can provide up to \$1,000 (50% cost-share) toward the plan cost. For details, check out www.sydenhamriver.on.ca/stewardship/healthy-watersheds-program/spri/.



TILLAGE PRACTICES FOR SOIL CONSERVATION

From a soil health perspective, healthy, productive soils are those that experience minimal wind and water erosion, have limited loss of pesticides and nutrients, and are high-yielding². To conserve soil and to achieve healthy, productive soils, it is imperative to adopt a reduced tillage or no-till program.

Under a conventional tillage program, less than 30% of crop residue is left on the soil surface. In this scenario, soil is more susceptible to wind and water erosion, and ultimately, tillage erosion can become an issue. This is particularly evident on the upper slopes of farm fields, whereby soil moves downhill after a pass, contributing to substantial soil loss. It is estimated that “over 100 tonnes per hectare of soil is lost from upper slopes [in Ontario] each year”².

REDUCED TILLAGE & NO-TILL BENEFITS

- ✓ Over 30% of the soil surface will be covered with crop residue, helping to mitigate wind, water, and tillage erosion
- ✓ Improved soil structure
- ✓ Increases organic matter
- ✓ Reduced soil compaction
- ✓ Increased soil microbial activity
- ✓ Cover crops can be worked into the regular crop rotation
- ✓ Helps with better placement of fertilizer

While transitioning to a reduced tillage/ no-till program takes time, trial and error, and financial investment, the benefits should not go unrecognized.

If you want to shift towards a reduced tillage system, please contact Jessica Van Zwol for potential funding opportunities. We offer farmers in the Sydenham Watershed funding for 50% cost-share, up to \$20,000, for eligible equipment and modifications.

**KEEP UP TO DATE ON OUR EVENTS:
[SCRCA.ON.CA/ABOUT-US/EVENTS/](https://www.scrca.on.ca/about-us/events/)**

Meet the SCRCA Stewardship Team!

The Stewardship Team will be able to assist with the application process or any questions you may have.

There are funding opportunities for a range of best management practices, that includes:

- ✓ Cover Crops
- ✓ Wind breaks
- ✓ Equipment Modifications
- ✓ Erosion Control Structures
- ✓ Wetland Restoration
- ✓ Riparian Plantings
- ✓ and so much more!

Stewardship Staff:

Jessica Van Zwol
Healthy Watershed Coordinator
jvanzwol@scrca.on.ca
519-245-3710 ext. 241

Lisa McNeill
Agricultural Stewardship Tech
lmcneill@scrca.on.ca
519-245-3710 ext. 125

Kailey Michnal
Agricultural Stewardship Tech
kmichnal@scrca.on.ca
519-245-3710 ext. 126

Jeff Sharp (trees only)
Conservation Services Specialist
jsharp@scrca.on.ca
519-245-3710 ext. 217

RESOURCES

¹Dagnew, A., Scavia, D., Wang, Y-C., Muenich, R., Long, C., and M. Kalcic. 2019. Modeling Flow, Nutrient, and Sediment Delivery from a Large International Watershed Using a Field-Scale SWAT Model. <https://doi.org/10.1111/1752-1688.12779>

²Gasser, P.-Y. (1993). Best management practices: Field crop production. Agriculture Canada ; Ontario Ministry of Agriculture and Food.

Best management practices - cropland retirement. <https://bmpbooks.com/>. (n.d.-a). <https://bmpbooks.com/media/Cropland-Retirement.pdf>

Find more information here:

sydenhamriver.on.ca/stewardship/healthy-watersheds-program/spri/

Follow us on social media to see all updates, info about events and more!



@SYDENHAMRIVER
@STCLAIRREGIONCA



@SYDENHAM RIVER
@ST CLAIR REGION
CONSERVATION AUTHORITY

This project was undertaken with the financial support of:
Ce projet a été réalisé avec l'appui financier de:



Environment Canada **Environnement Canada**

Cover Crops

